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useMemo Hook:

What's useMemo hook:

It's a hook which is used in **functional component** and return the **memoised value**, where we are **caching the value**, so that it doesn't need to be **recalculate it**, it's **based on the dependency change**, and it will help **to improve the performance**.

When to Use useMemo:

- When you deal with **heavy computations**.
- When the **same computation is repeated multiple times** and **returns the same result for the same inputs**.
- When **rendering large lists or data grids** and you want to avoid unnecessary re-renders.

When Not to Use React useMemo:

We should not use useMemo **for memoizing a function such as a callback**.

How is it work:

const memoizedResult = useMemo(function, dependencies);

- During **initial rendering**, useMemo(function, dependencies) invokes function, **memoizes the calculation result**, and returns it to the component.
- If the **dependencies don't change** during the next renderings, then useMemo() doesn't invoke function, but **returns the memoized value**. But if the **dependencies change** during re-rendering, then useMemo() invokes function, **memoizes the new value, and returns it**.
- If you pass an **empty array** ([]) as the dependencies, the memoized value will be computed only once during the initial render and will remain the same for subsequent renders.

Difference between useMemo vs useEffect:

It's important to note that we shouldn't add any code to useMemo that we **don't want to be run when the page or component is being rendered**. **Any code that affects another component than the current one** (called side effects) **should be kept in a useEffect**.

Difference between useMemo vs useCallback:

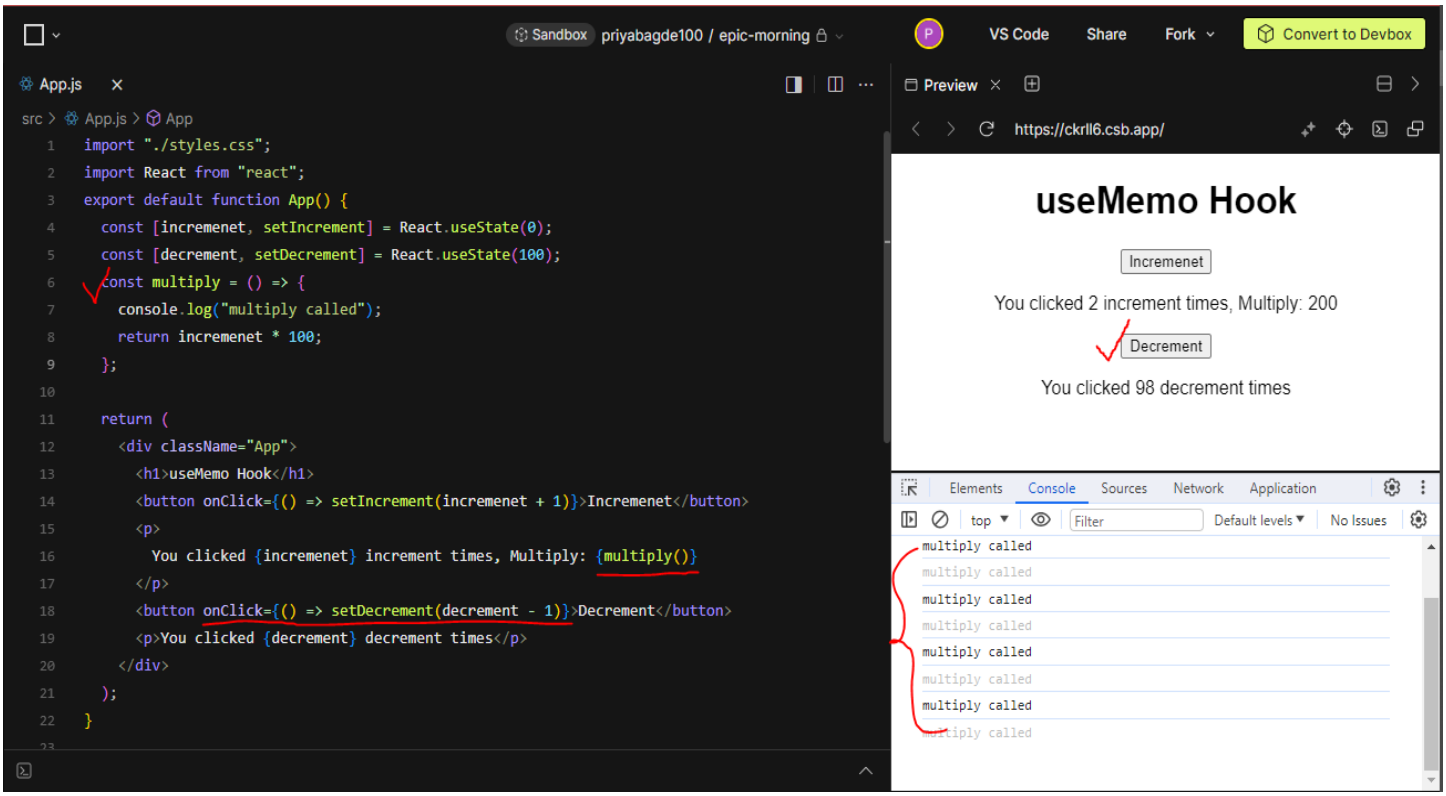
The useCallback hook allows you **to memoize the entire function**, and the useMemo hook allows you to **memoize the output of functions.** Also, let's have the difference between while using it.

```jsx
import { useCallback } from 'react';

function MyComponent({ prop }) {
  const callback = () => {
    return 'Result';
  };
  const memoizedCallback = useCallback(callback, [prop]);

  return <ChildComponent callback={memoizedCallback} />;
}
```

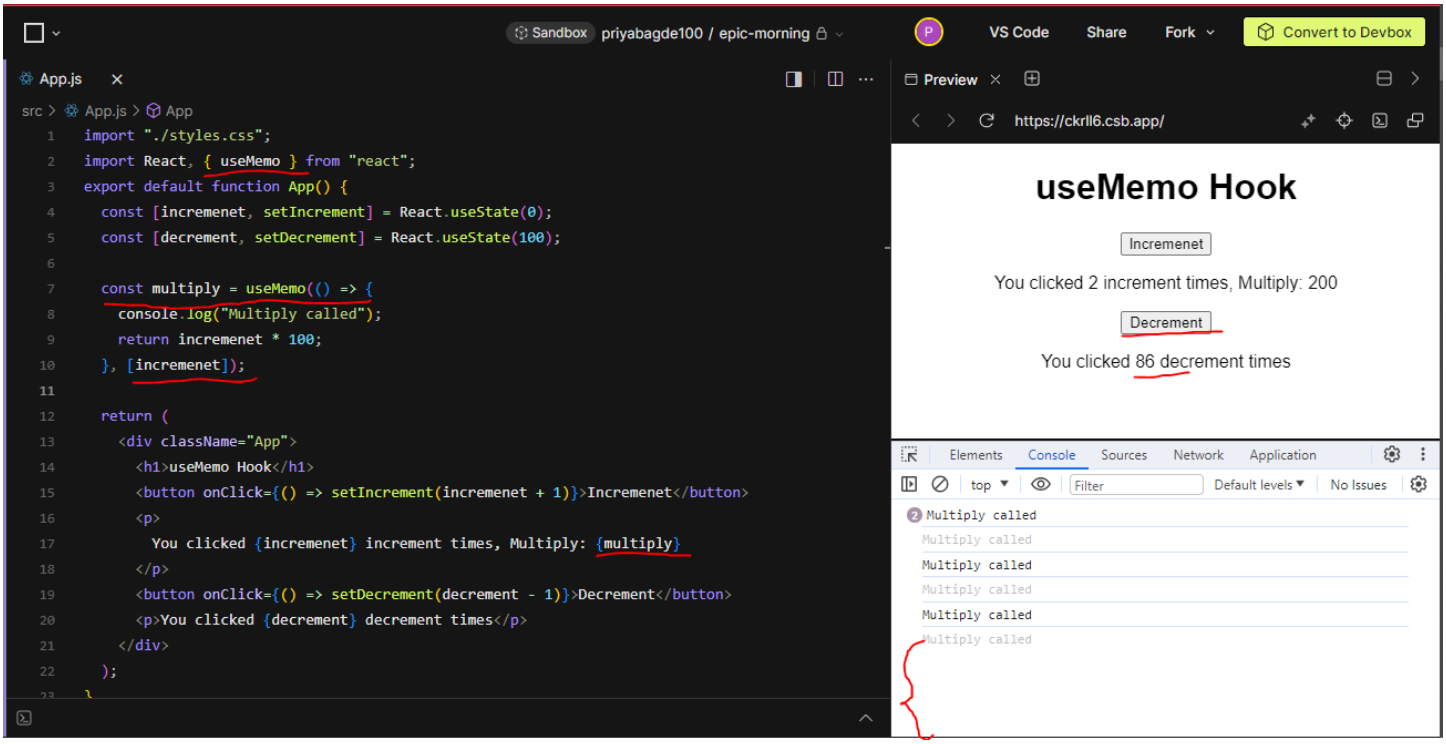
```jsx
import { useMemo } from 'react';

function MyComponent({ prop }) {
  const callback = () => {
    return 'Result';
  };
  const memoizedCallback = useMemo(() => callback, [prop]);

  return <ChildComponent callback={memoizedCallback} />;
}
```

Example:

Suppose you have an **increment and decrement counter**. Also, you have a **multiply function**. Now when you **call the multiply function where we are multiplying with the increment (i.e, no usage of decrement).** When you click the increment button the multiply function will get call which is as expected because we are using the increment, but **when you click on decrement button then there is a multiply function ALSO, getting call.WHY ?**



You can restrict the Multiply function to get call on decrement button **using the useMemo hook**, where you need to pass the dependency array and based on the dependency it will call.



What's the difference between useMemo and React.memo in reactjs:

Aspect	useMemo	React.memo
Purpose	Memoizes the result of a function call based on dependencies	Memoizes the rendering of a functional component based on its props
Usage	Used inside functional components to optimize expensive calculations or data transformations	Used to optimize functional components by preventing unnecessary re-renders based on prop changes
Input	Function and dependencies	Functional component
Returns	Memoized value	Memoized component
Dependencies	Re-runs the function when dependencies change	Re-renders the component when props change
Performance	Optimizes calculations within the component	Optimizes rendering of the component
Example Use Case	Memoizing a complex calculation within a component	Memoizing the rendering of a component with static props